

behind the interparietal, bordered by a pair of nuchals and a pair of temporals; three pairs of nuchals; fifth upper labial below the centre of the eye. Ear-opening oval, larger than the transparent palpebral disk, its anterior border with two or three short projecting lobules. 34 scales round the middle of the body, dorsals largest and feebly striated. Præanal scales scarcely enlarged. The adpressed limbs fail to meet. Digits moderately long, subcylindrical; subdigital lamellæ smooth, 16 to 18 under the fourth toe. Tail once and a half as long as head and body. Dark olive-grey above, with small black spots and a blackish-brown wavy lateral band, passing through the eye; this band may be dotted with white; lower parts leaden grey or blackish.

	millim.
Total length	168
Head	14
Width of head	9
Body	54
Fore limb	18
Hind limb	24
Tail	100

The British Museum is indebted to Professor Arthur Dendy for specimens of this species, most nearly allied to *L. moco*, D. & B., of New Zealand. Professor Dendy informs me that the new lizard is common on Pitt Island, a small island south-east of Chatham Island, whilst no lizards have yet been recorded from the latter.

XXXIII.—Notes on the Classification of Teleostean Fishes.—

II. On the Berycidae. By G. A. BOULENGER, F.R.S.

FIRST included by Cuvier among his Percoides, the Berycidae, after having been raised to family rank by Günther in 1859, have later been regarded by the same author as the representatives of a still higher division, the Beryciformes, equivalent to his Perciformes. The reasons for such a course have never been explained otherwise than by the brief diagnosis which, in Günther's latest work, 'Study of Fishes,' runs thus:—"Body compressed, oblong, or elevated; head with large muciferous cavities, which are covered with a thin skin; ventral fins thoracic, with one spine and more than five soft rays (in *Monocentris* with two only)." As compared with the definition of the Perciformes, the first of these characters

has nothing distinctive; the second is decidedly misleading, since the heads of *Myripristis* and *Holocentrum*, two of the principal genera of Berycidae, show the muciferous cavities even less developed than in an ordinary perch, whilst these cavities are excessively large in the Percid genera *Acerina* and *Percarina*. The third character is evidently the leading one; but here again an inconsistency occurs, for, if we turn back a few pages in the book, we find in the account of the Perciformes a note to the effect that "A North-American freshwater genus, *Aphredoderus*, occupies a perfectly isolated position in the system and is evidently the type of a distinct family. It resembles the 'Sun-fishes' [Percidae] of the same country with regard to the structure of the vertical fins, but has the vent situated in front of the ventrals, which are composed of more than five soft rays." And besides, a new genus, *Malacosarcus*, was shortly after, in the "Report on the 'Challenger' Deep-sea Fishes," added by the same author to the Berycidae, in spite of its ventrals being described as five-rayed. Günther has therefore failed to give us a definition by which his Beryciformes can be distinguished from the Perciformes. Let us see if later authors have been more successful.

In his 'Memoir on the Families and Subfamilies of Fishes,' which summarizes his views on classification in 1893, Gill adopts a division of Acanthopterygii, named Berycoidea, equivalent to Scombroidea, Percoidae, &c., which contains six families:—Stephanoberycidae, Berycidae, Trachichthyidae, Monocentridae, Holocentridae, Anomalopidae. This division was not defined in this paper, but was shortly after by Jordan and Evermann, who have adopted the families of Gill and added to them the Bathyclupeidae, the Polymixiidae (Berycidae of Günther), and the Mullidae, the pertinence of the two latter to this group being, however, regarded as questionable. In their definition the only two distinctive characters, both accompanied by restrictions which impair their value for diagnostic purposes, are the following:—"Ventral fins with 1 spine, usually 7 soft rays, the number of soft rays varying from 5 to 10; air-bladder in some species retaining its duct throughout life (a character verified only in *Beryx*)." The authors add that they regard the group as a valid one, "allied to the Percoidae and Scombroidei, but characterized as a whole by the retention of the archaic characters of the persistent air-duct and the increased number of ventral rays." The character of the persistent air-duct between the swim-bladder and the intestinal canal, first pointed out by Kner in *Holocentrum*, by Alcock in *Bathy-*

clupea, and verified by the American authors in *Beryx*, is well known to be absent in the Mullidæ, and I have failed to find it in *Trachichthys*, *Monocentris*, and *Polymixia*; it is therefore by no means distinctive of the group, and only shows the nearer affinity which these Acanthopterygians bear to the Haplomous Physostomes, from which they are probably directly descended.

I was very curious to see how Smith Woodward would deal with the subject in his newly-issued fourth volume of the 'Catalogue of Fossil Fishes,' the Berycidæ being so richly represented in Cretaceous deposits; but, to my disappointment, nothing new appears in his definition of the group, which is much in the style of his predecessors, and consists merely of these few words:—"Division Beryciformes. —Pelvic fins thoracic, usually with more than five articulated rays in addition to the spine. No bony stay between circum-orbital ring and preoperculum." The second character appears merely for the purpose of contrast with the division Scorpeniformes. Three families are grouped under the Beryciformes:—Berycidæ (in Günther's sense), Aphredoderidæ, and Cyttidæ. As I shall explain presently, I have every reason to think the author justified in thus placing the Aphredoderidæ near the Berycidæ, but I can see no reason for the association with them of the Cyttidæ, which, in spite of an extra ray to the ventral fins, are as little allied to them as the so-called Scombriformes, a group in which families with an increased number of ventral rays also occur (Grammicolepidæ, Lamprididæ).

I have set myself the task of making a careful survey of all the characters available for defining the "Beryciformes," but have absolutely failed to discover any single feature by which they could be diagnosed from the "Perciformes." An examination of the skeleton has convinced me that *Polymixia* has been correctly placed near *Beryx*, and that it bears no special affinity to the Mullidæ, which are themselves more nearly related to the Sparidæ. The Anomalopidæ are probably wrongly placed near the Berycidæ, but I have not been able to examine the skeleton. *Aphredoderus*, on the other hand, has all the essential characters of the Berycidæ, and may be regarded as the freshwater representative of that family. Its vertebral column is of the same type, consisting of 30 vertebræ (14 præ-sacral and 16 caudal)*, the para-

* 29 (14+15) according to Jordan and Evermann (Fish. N. Am. i. p. 785), who raise *Aphredoderus* to the rank of a suborder, Xenarchi, with the following definition:—"We place in a distinct suborder, next to the Salmoperæ [Percosidæ, a family of Haplomi], the singular little family

pophyses first appearing on the fifth, the præmaxillaries are feebly but distinctly protractile; the second suborbital emits an internal lamina for the support of the eyeball, and this lamina is triangular as in *Trachichthys*; the pelvic bones are quite similar to those of the latter genus, not forked, as stated by Cope and after him by Woodward*, and attached to the clavicular symphysis. The forward position of the vent, so exceptional a character among Acanthopterygians, is found likewise, though to a somewhat less degree, in the Berycid *Trachichthys Traillii*. The Eocene freshwater genera *Amphiplaga*, *Trichophanes*, and *Asineops* should, perhaps, also enter the Berycidae, but from the descriptions and figures given by Cope † I have failed to grasp the near affinity which is supposed to exist between them and the Aphredoderida. As an example of the uncertainty in which we still are respecting the exact systematic position of these fossils, I would point out that *Pygæus* of Agassiz, which Cope was inclined to regard as nearly allied to and possibly identical with *Asineops*, is placed by Woodward among the Chætodontida.

One thing is certain, the Berycidae are a very ancient and generalized group of Acanthopterygians, and were richly represented in the Upper Cretaceous by several genera which are identical with or closely related to the existing forms. In those days, however, the Serranidae had already dawned (*Prolates*), and it is probable that the connexion between the two families was as close as it is at present. No better evidence of this near affinity can be adduced than a comparison of *Beryx* proper with *Pempheris*, the two genera agreeing so completely in structure, both external and internal ‡, with the sole exception of the rays in the ventral fins, that I am much inclined to doubt whether the difference between them should be regarded as greater than that between the former and *Trachichthys*. The relation between the Berycidae and the Pempheridae has already been recognized,

of Pirate Perches, which finds its natural position between the Percopsida and the Percoid forms. Structure of mouth and skeleton, so far as known, essentially that of the Percoid fishes. Dorsal fin single, with few small spines; ventrals thoracic, with a small spine, and more than five soft rays. Air-duct not examined, probably obsolete, the air-bladder large and adherent. Intestinal canal ending at the throat in the adult, the vent variously posterior in the young. Vertebrae 29."

* A character taken from the Eocene genus *Erismatopterus*, which, having the pelvis suspended from the postclavicular bones, probably bears no near relation to the Berycidae.

† Vert. Tert. Form. West, i. p. 80 (1883).

‡ The number of vertebrae assigned to *Pempheris* by Jordan and Evermann, viz. 10+24, is obviously a misprint for 10+14.

indirectly, by Gill when including *Bathyclupea* among his Berycoidea, this genus being correctly referred by Alcock to the vicinity of *Pempheris*. The latter author is, however, mistaken in following Günther in placing *Pempheris* in the family Kurtidæ, the genus *Kurtus* bearing no sort of affinity to *Pempheris* and *Bathyclupea*, as is well shown by its most remarkable skeleton, to which a brief allusion has been made by Valenciennes. The vertebral column of *Kurtus indicus* consists of 24 vertebræ; the ribs of the third and fourth are free and slender, whilst the following are immovably fixed between rings formed by the ossification of the outer membrane of the elongate air-bladder in a manner unique among fishes; the first interhæmal is very strong, attached between the fifth and sixth rings of the capsule of the air-bladder, and directed obliquely forwards; six interneurals support short spines, the first of which is directed forwards. The skull is peculiar for its very strong, denticulate, occipital crest, which ends posteriorly in a curved spine bent forward; this spine has been incorrectly described by Valenciennes as being supported by the first interneural bone. The suborbitals are slender and do not emit a suborbital lamina. The most remarkable peculiarity in the skeleton of *Kurtus* lies in the absence of the scapula, the coracoid, formed as in a normal Percid or Scombrid, supporting four small pterygials. The Kurtidæ must be regarded as forming an isolated group near the Scombridæ, without any close relation to the Berycidæ and Pempheridæ.

I have also examined the skeleton of *Monocentris*, which has never been described; and although it shows affinity to the Berycidæ, it differs considerably from them in the total absence of ribs on any of the vertebræ anterior to the seventh, which character, together with the bony armour of the body and the reduced number (2 or 3) of soft rays in the ventral fin, fully justifies the family Monocentridæ proposed by Gill.

Stephanoberyx, Gill, and its close ally *Malacosarcus*, Gthr., have abdominal ventral fins, with 5 rays, no spines to the fins, and, as I have ascertained in a specimen of *Stephanoberyx Monœ*, an open duct to the air-bladder. I therefore refer the Stephanoberycidæ to the Haplomi, to the definition of which they perfectly answer.

The numbers of vertebræ in the Berycidæ and allied families, of which the skeleton has been examined, are as follows:—

BERYCIDÆ.

<i>Beryx decadactylus</i>	10+14=24.	Parapophyses from	6th.
<i>Polymiria japonica</i>	13+16=29.	"	3rd.
<i>Aphredoderus Sayanus</i>	14+16=30.	"	5th.
<i>Cantolepis subulidens</i> (after Garman)	12+15=27.	"	?
<i>Trachichthys mediterraneus</i>	11+15=26.	"	6th.
— <i>pacificus</i> (after Garman) ..	11+16=27.	"	6th.
<i>Myripristis murdjan</i>	11+15=26.	"	5th.
<i>Holocentrum rubrum</i>	11+16=27.	"	5th.
— <i>diadema</i>	11+16=27.	"	5th.
— <i>violaceum</i>	11+16=27.	"	6th.
— <i>sammara</i>	11+16=27.	"	6th.

MONOCENTRIDÆ.

<i>Monocentris japonicus</i>	13+13=26.	"	7th.
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PEMPHERIDÆ.

<i>Pempheris otaitensis</i>	10+14=24.	"	6th.
— <i>molucca</i>	10+15=25.	"	6th.
<i>Bathylupea Hoskynii</i>	10+21=31.	"	5th.

Having purged the Berycidae of the forms which had been unduly associated with them, I find that a family of that name may still be defined by the number of soft rays in the ventral fin exceeding five, although I am not satisfied that such a group is a perfectly natural one, owing to the closer affinity which appears to exist in other respects between *Beryx* and the Pempheridæ than between it and the other genera placed in the same family. Anyhow the group Beryciformes, as opposed to Perciformes and Scombriformes, cannot be maintained. The family may be thus diagnosed:—

One or more of the suborbital bones with an internal lamina supporting the globe of the eye; entopterygoid present. Anterior vertebræ without transverse processes; all or most of the ribs inserted on the transverse processes where these are developed. Two nostrils on each side. Gill-membranes free from isthmus; gills four, a slit behind the fourth; pseudobranchiæ present. Lower pharyngeal bones separate. Ventral fins with one spine and six to thirteen soft rays.

Before presenting, in synoptic form, the principal characters of the thirteen genera into which the known living Berycids may be divided, I wish to offer some remarks on the limits of the genus *Trachichthys*.

This genus was founded by Shaw on a small fish, *T. australis*, in which the spines of the dorsal fin are few in number (3), close together, and graduating towards the longer soft

rays, as in *Beryx* or *Pempheris*. Several similar species, with the dorsal spines somewhat more widely spaced, and four to six spines, as in *Hoplostethus*, have since been described from Australia and New Zealand. In 1863 Johnson discovered a large allied form at Madeira, which he named *T. Darwinii*; the same fish has since been re-discovered in Japan and in the Bay of Bengal. The dorsal fin is, however, quite different from that of *T. australis*, and more like that of a *Myripristis* or *Holocentrum*, the spines (eight in number) being strong, wide apart, increasing in length to the fourth, and then decreasing to the penultimate, thus producing a shallow notch between the two divisions of the fin. How such a marked difference has not yet been seized upon for generic distinction I fail to understand, and must now propose the name *Gephyroberyx* to designate the genus of which *T. Darwinii* is so far the only representative.

In *T. Trailli*, Hutton, from the South Pacific, the spines of the dorsal are more widely spaced than in the typical *Trachichthys*, but they likewise graduate towards the soft rays. As first observed by Günther, the vent is far forward, between the ventral fins, in front of, and not, as usual, behind, the series of abdominal scales. This species has therefore very properly been made the type of a distinct genus, *Paratrachichthys*, by Waite in 1899.

On the other hand, I would endorse the opinion of Lowe, that *Hoplostethus* is not entitled to rank as generically distinct from *Trachichthys*, the presence or absence of minute teeth on the vomer not being in this case a character of sufficient importance.

Synopsis of the Genera.

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| I. Anal fin longer than dorsal; dorsal spines feeble, 4 to 7, graduated; anal spines 3 or 4; vertebrae 24. . . . | 1. <i>Beryx</i> , Cuv. |
| II. Anal fin not longer than dorsal; vertebrae 26 to 30. | |
| A. Dorsal spines feeble, 2 to 4, graduated; belly not serrated. | |
| 1. Hyoid barbels; anal spines 3 or 4. | 2. <i>Polymiria</i> , Lowe. |
| 2. No barbels; anal spines 1 or 2. | |
| a. Scales small; head moderately large, with feeble dentition; vent anterior to ventrals. . . . | 3. <i>Aphredoderus</i> , Le Sueur. |
| b. Scales large; head moderately large, with feeble dentition; vent posterior to ventrals. | |
| Anal far behind dorsal; eye moderate . . . | 4. <i>Melamphaes</i> , Gthr. |
| Anal below dorsal; eye moderate. | 5. <i>Plectromus</i> , Gill. |
| Anal below dorsal; eye very small | 6. <i>Scopelogadus</i> , Vaill. |

- c. Scales minute; head very large; dentition powerful.
- Scales reduced to minute asperities; small canines in the lower jaw 7. *Anoplogaster*, Gthr.
- Scales leaf-like, pedunculated; huge fang-like teeth in both jaws 8. *Caulolepis*, Gill.
- B. Dorsal spines 3 to 8; anal spines 2 or 3; belly serrated.
- Dorsal spines 3 to 6, graduated; vent far behind ventrals 9. *Trachichthys*, Shaw.
- Dorsal spines 5 or 6, graduated; vent between ventrals 10. *Paratrachichthys*, Waite.
- Dorsal spines 8, third and fourth longest. . 11. *Gephyroberyx*, Blgr.
- C. Dorsal spines strong, 10 to 12; anal spines 4.
- No large spine at angle of præopercle . . . 12. *Myripristis*, Cuv.
- A large spine at angle of præopercle . . . 13. *Holocentrum*, Art.

XXXIV.—*Descriptions of new Genera and Species of Hymenoptera from the Oriental Zoological Region (Ichneumonidae, Fossores, and Anthophila).* By P. CAMERON.

[Continued from p. 155.]

ANCARIA, gen. nov.

Areolet small, quadrate, slightly narrowed on the lower side at the apex; the second transverse cubital nervure is faint; the recurrent nervure is received shortly before the middle and is largely bullated in its centre; the transverse basal nervure is interstitial. Antennæ filiform, longish, fully as long or longer than the body, annulated with white in the middle. Eyes large, slightly converging on the lower side. Mandibles with two sharp, almost equal teeth. Occiput margined. Parapsidal furrows distinct. Metathorax elongate, rough, and bearing two transverse keels; the spiracles small, oval. Petiole curved, narrow, not much widened towards the apex, and is as long as the second abdominal segment; the spiracles are at the base of the dilated part behind the middle.

Has the small areolet with almost obsolete second transverse cubital nervure of *Mesostenus*, but may be known from it by the longer and much more slender antennæ, by the more slender petiole (which is not nearly so much dilated at the apex), by the smaller oval metathoracic spiracles, by the smooth and shining median segment, and by the recurrent nervure not being received near the apex of the areolet. The scutellum is roundly convex and narrowed towards the